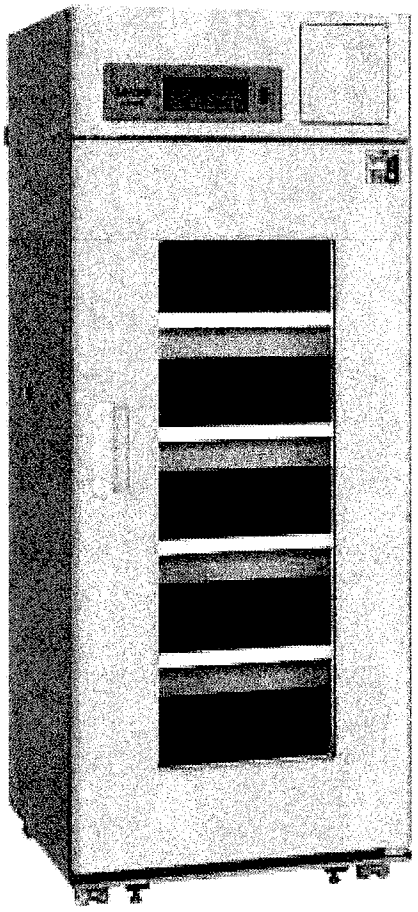
SANYO

INSTRUCTION MANUAL

MPR-721
MPR-721R

Pharmaceutical Refrigerator



MPR-721R

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INTRODUCTION

■ Read this manual carefully before using the appliance and follow the instructions for safety operation.

■ Sanyo never guarantee any safety if the appliance is used for any objects other than intended use or used by any procedures other than those mentioned in this manual.

■ Keep this manual in an adequate place to refer to it as necessary.

■ The contents of the manual will be subjected to change without notice due to the improvement of performance or functions.

■ Contact Sanyo sales representative or agent if any page of the manual is lost or page order is incorrect.

■ Contact Sanyo sales representative or agent if any point in this manual is unclear or if there are any inaccuracies.

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PRECAUTIONS FOR SAFE OPERATION

It is imperative that the user complies with this manual as it contains important safety advice.

Items and procedures are described so that you can use this unit correctly and safely. If the precautions advised are followed, this will prevent possible injury to the user and any other person.

Precautions are illustrated in the following way:

⚠WARNING

Failure to observe WARNING signs could result in a hazard to personnel possibly resulting in serious injury or death.

⚠CAUTION

Failure to observe CAUTION signs could result in injury to personnel and damage to the unit and associated property.

Symbol shows;

△ this symbol means caution.

⃠ this symbol means an action is prohibited.

● this symbol means an instruction must be followed.

Be sure to keep this manual in a place accessible to users of this unit.

< Label on the unit >

This mark is labeled on the cover in which the electrical components of high voltage are enclosed to prevent the electric shock.
The cover should be removed by a qualified engineer or a service personnel only.

PRECAUTIONS FOR SAFE OPERATION

⚠WARNING

Do not use the unit outdoors. Current leakage or electric shock may result if the unit is exposed to rain water.

Only qualified engineers or service personnel should install the unit. The installation by unqualified personnel may cause electric shock or fire.

Install the unit on a sturdy floor and take an adequate precaution to prevent the unit from turning over. If the floor is not strong enough or the installation site is not adequate, this may result in injury from the unit falling or tipping over.

Never install the unit in a humid place or a place where it is likely to be splashed by water. Deterioration of the insulation may result which could cause current leakage or electric shock.

Never install the unit in a flammable or volatile location. This may cause explosion or fire.

Never install the unit where acid or corrosive gases are present as current leakage or electric shock may result due to corrosion.

Always ground (earth) the unit to prevent electric shock. If the power supply outlet is not grounded, it will be necessary to install a ground by qualified engineers.

Never ground the unit through a gas pipe, water main, telephone line or lightning rod. Such grounding may cause electric shock in the case of an incomplete circuit.

Connect the unit to a power source as indicated on the rating label attached to the unit. Use of any other voltage or frequency other than that on the rating label may cause fire or electric shock.

Never store volatile or flammable substances in this unit if the container cannot be sealed. These may cause explosion or fire.

Do not insert metal objects such as a pin or a wire into any vent, gap or any outlet on the unit. This may cause electric shock or injury by accidental contact with moving parts.

Use this unit in safe area when treating the poison, harmful or radiate articles. Improper use may cause bad effect on your health or environment.

Turn off the power switch (if provided) and disconnect the power supply to the unit prior to any repair or maintenance of the unit in order to prevent electric shock or injury.

Do not touch any electrical parts (such as power supply plug) or operate switches with a wet hand. This may cause electric shock.

PRECAUTIONS FOR SAFE OPERATION

⚠WARNING

Ensure you do not inhale or consume medication or aerosols from around the unit at the time of maintenance. These may be harmful to your health.

Never splash water directly onto the unit as this may cause electric shock or short circuit.

Never put containers with liquid on the unit as this may cause electric shock or short circuit when the liquid is spilled.

Never bind, process, or step on the power supply cord, or never damage or break the power supply plug. A broken supply cord or plug may cause fire or electric shock.

Do not use the supply cord if its plug is loose. Such supply cord may cause fire or electric shock.

Never disassemble, repair, or modify the unit yourself. Any such work carried out by an unauthorized person may result in fire, or electric shock or injury due to a malfunction.

Disconnect the power supply plug if there is something wrong with the unit. Continued abnormal operation may cause electric shock or fire.

When removing the plug from the power supply outlet, grip the power supply plug, not the cord. Pulling the cord may result in electric shock or fire by short circuit.

Disconnect the power supply plug before moving the unit. Take care not to damage the power cord. A damaged cord may cause electric shock or fire.

Disconnect the power plug when the unit is not used for long periods. Keeping the connection may cause electric shock, current leakage, or fire due to the deterioration of insulation.

If the unit is to be stored unused in an unsupervised area for an extended period, **ensure that children do not have access and that doors cannot be closed completely.**

The disposal of the unit should be accomplished by appropriate personnel. Remove doors to prevent accidents such as suffocation.

Do not put the packing plastic bag within reach of children as suffocation may result.

PRECAUTIONS FOR SAFE OPERATION

⚠CAUTION

- **Use a dedicated power source** (a dedicated circuit with a breaker) as indicated on the rating label attached to the unit. A branched circuit may cause fire resulting from abnormal heating.

- **Connect the power supply plug to the power source firmly after removing the dust on the plug.** A dusty plug or improper insertion may cause a heat or ignition.

- **Never store corrosive substances such as acid or alkali** in this unit if the container cannot be sealed. These may cause corrosion of inner components or electric parts.

- **Check the setting when starting up of operation after power failure or turning off of power switch.** The stored items may be damaged due to the change of setting.

- **Be careful not to tip over the unit** during movement to prevent damage or injury.

- **Prepare a safety check sheet** when you request any repair or maintenance for the safety of service personnel.

ENVIRONMENTAL CONDITIONS

This equipment is designed to be safe at least under the following conditions (based on the IEC 61010-1):

1. Indoor use;

2. Altitude up to 2000 m;

3. Ambient temperature 5°C to 40°C

4. Maximum relative humidity 80% for temperature up to 31°C decreasing linearly to 50% relative humidity at 40°C;

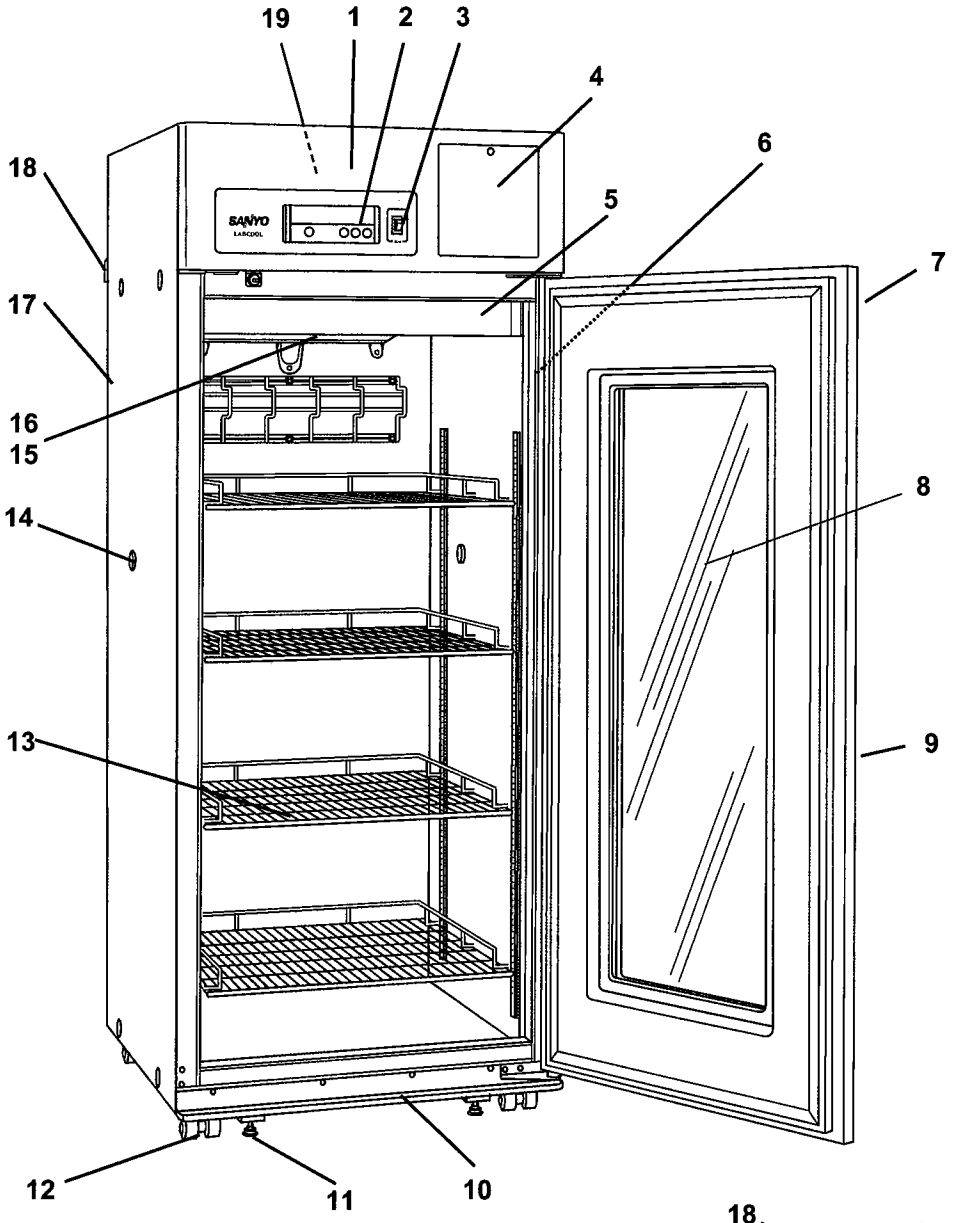
5. Mains supply voltage fluctuations not to exceed ±10% of the nominal voltage;

6. Other supply voltage fluctuations as stated by the manufacture;

7. Transient overvoltages according to Installation Categories (Overvoltage Categories) II; For mains supply the minimum and normal category is II;

8. Pollution degree 2 in accordance with IEC 60664.

REFRIGERATOR COMPONENTS



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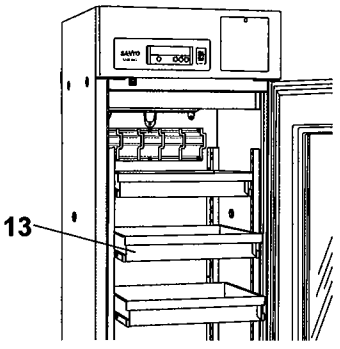

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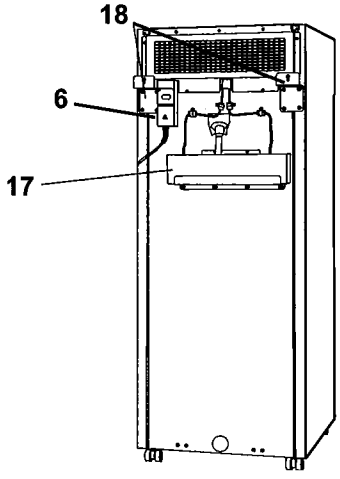


Back side

REFRIGERATOR COMPONENTS

1. Front cover: Open this cover when connecting the remote alarm or replacing glow stater for fluorescent lamp.

2. Control panel: The chamber temperature and alarms can be set through the keys on the control panel. The temperature indicator and lamps are also provided on the control panel. Refer to page 11.

3. Light switch: This switch is used for turning the fluorescent lamp off and on.

4. Space for automatic temperature recorder: An automatic temperature recorder (optional component) can be mounted here. See page 28.

5. Fluorescent lamp: 20 W lamp. See page 21 for replacement.

6. Circuit breaker (right back side): This disconnects the power when any abnormality is occurred and over current is rushed. Rated AC 250 V, 10 A.

7. Lock: Turn the key counterclockwise through 180° to securely lock the door.

8. Glass window: The window may have condensation in high humidity environment. Wipe off the condensation with a soft dry cloth.

9. Handle: Always hold the handle when opening/closing the door.

10. Condensation tray: The condensation on the door is accumulated in this tray. Wipe off the water occasionally.

11. Leveling foot: Adjust the height of the leveling feet by turning the screw bolts until the unit is level.

12. Castor: When installing the unit the castors can be raised from the ground by using the leveling feet above.

13. Shelf (MPR-721 only): Items to be stored in the chamber must be placed on the shelves. The maximum storage weight for each shelf is 50 kg. Do not put stored items directly onto the interior floor of the chamber. See page 15.

Drawer (MPR-721R only): Items to be stored in the chamber must be placed on the drawers. The maximum storage weight for each drawer is 40 kg.

14. Access port: This port allows temperature measurement cables to enter the chamber from outside. A total of three (3) ports are provided; left side, right side and top.

15. Air exhaust vent: Do not block this vent. If this vent is blocked, temperature regulation will become unstable. Do not place stored items in the path of the cold air.

16. Air intake vent: Do not block this vent. If this vent is blocked, temperature regulation will become unstable. Do not insert a finger or any foreign object into this vent as there is danger from the internal fan.

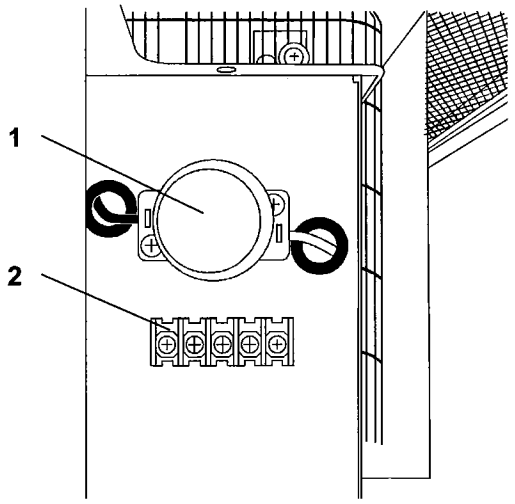
17. Evaporating tray (back side): Defrost water from the evaporator accumulates on the tray and evaporates into the atmosphere. See page 20 for cleaning.

18. Fixture (back side): These keep the adequate space between the unit and wall and also can be used for fixing the unit. See page 13.

19. Battery for power failure alarm MPR-48B (option): MPR-48B (option) is installed. See page 31.

REFRIGERATOR COMPONENTS

Inside of front cover

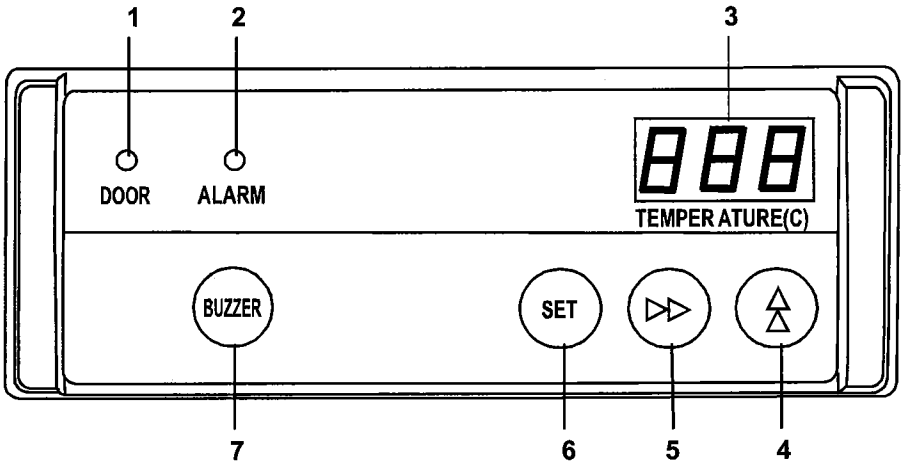


1. Glow starter (with cover): This is for the fluorescent light. It is recommended that the glow starter is also replaced when the fluorescent light is replaced. Refer to page 21.

2. Remote alarm terminal: This is used to connect the unit to an exterior alarm to notify users of any malfunction. Refer to page 18.

REFRIGERATOR COMPONENTS

Control panel



1. Door alarm lamp (DOOR): This lamp is lit when the door is opened.

2. Alarm lamp (ALARM): This lamp flashes during an alarm condition.

3. Digital temperature indicator: This indicator shows the present chamber temperature or set temperature.

4. Numerical value shift key (▲): Pressing this key in the set mode causes the numerical value to scroll up. ON-OFF of key lock can be selected by pressing this key in the key lock mode. See page 16.

5. Digit shift key (▶▶): Pressing this key in the set mode alters the digit to be set. Key lock is available by pressing this key for more than 5 seconds in the temperature display mode. See page 16.

6. Set key (SET): Temperature setting mode is initiated by pressing this key. Once the key is pressed, the digit to be changed will flash. Pressing this key again after setting the desired temperature stores the set temperature in the memory.

7. Alarm buzzer stop key (BUZZER): To silence the audible alarm, press this key. Press it once again to reactivate the alarm.

INSTALLATION SITE

To operate this unit properly and to obtain maximum performance, install the unit in a location with the following conditions:

■ A location not subjected to direct sunlight

Do not install the unit under direct sunlight. Installation in a location subjected to direct sunlight cannot obtain the intended performance.

■ A location with adequate ventilation

Leave at least 10 cm around the unit for ventilation. Poor ventilation will result in a reduction of the performance and consequently the failure.

■ A location away from heat generating sources

Avoid installing the unit near heat-emitting appliances such as a heater or a boiler etc. Heat can decrease the intended performance of the unit.

■ A location with little temperature change

Install the unit under stable ambient temperature. The allowable ambient temperature is between -5 and +35°C.

■ A location with a sturdy and level floor

Always install the unit on a sturdy and level floor. The uneven floor or tilted installation may cause failure or injury. Install the unit in stable condition to avoid the vibration or noise. Unstable condition may cause vibration or noise.

⚠ WARNING

Install the unit on a sturdy floor. If the floor is not strong enough or the installation site is not adequate, this may result in injury from the unit falling or tipping over.

Select a level and sturdy floor for installation. This precaution will prevent the unit from tipping. Improper installation may result in water spillage or injury from the unit tipping over.

■ A location not prone to high humidity

Install the unit in the ambient of 80% R.H. or less humidity. Installation under high humidity may cause current leakage or electric shock.

⚠ WARNING

Do not use the unit outdoors. Current leakage or electric shock may result if the unit is exposed to rain water.

Never install the unit in a humid place or a place where it is likely to be splashed by water. Deterioration of the insulation may result which could cause current leakage or electric shock.

■ A location without flammable or corrosive gas

Never install the unit in a flammable or volatile location. This may cause explosion or fire or may result in the current leakage or electric shock by the corrosion of the electrical components.

■ A location without the possibility of anything fall

Avoid installing the unit in the location where anything can fall down onto the unit. This may cause the breakdown or failure of the unit.

INSTALLATION

1. Removing the packaging materials and tapes

Remove all transportation packaging materials and tapes. Open the doors and ventilate the unit. If the outside panels are dirty, clean them with a diluted neutral dishwashing detergent. (Undiluted detergent can damage the plastic components. For the dilution, refer to the instruction of the detergent.) After the cleaning with the diluted detergent, always wipe it off with a wet cloth. Then wipe off the panels with a dry cloth.

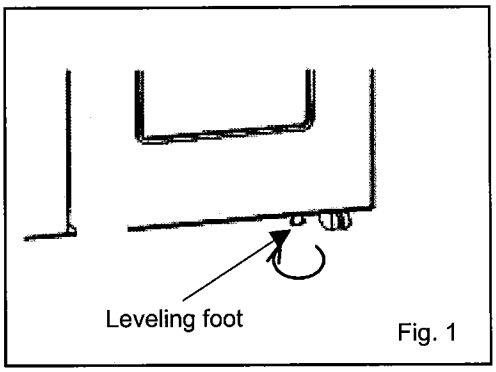


Fig. 1

2. Adjusting the leveling feet

Extend the leveling feet by rotating them counterclockwise to contact them to the floor. Ensure the unit is level. See Fig. 1.

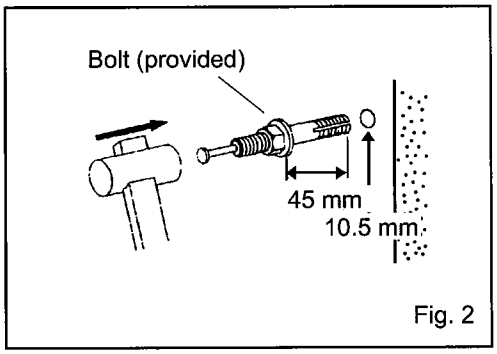


Fig. 2

3. Fixing the unit

Two fixtures are attached to the rear of the frame. Fix the frame to the wall by attaching a rope or chain between the wall and the fixtures.

If holes can be drilled in the wall, drill a 10.5 mm diameter hole (Fig. 2) and fix the unit by using the special bolt-nut supplied. This bolt-nut can only be used on a concrete wall.

4. Ground (earth)

The ground (earth) is for preventing the electric shock in the case of the electrical insulation is somehow degraded. Always ground the unit at the time of installation.

⚠WARNING

Use a power supply outlet with ground (earth) to prevent electric shock. If the power supply outlet is not grounded, it is necessary to install a ground by qualified engineers.

Never ground the unit through a gas pipe, water main, telephone line or lightning rod. Such grounding may cause electric shock in the case of an incomplete circuit.

START-UP OF UNIT

Follow the procedures for the initial and consequent operations of the unit.

1. Connect the power cord to the dedicated outlet with appropriate rating.

> **⚠CAUTION**
> If the unit is unplugged or the power to the unit is interrupted, do not restart the unit for at least 5 minutes. This protects the compressor.

2. On start-up, the alarm buzzer sometimes operates. In this case, stop the buzzer by pressing the alarm buzzer stop key (BUZZER).

3. Set the chamber temperature to 5°C.

4. Allow the chamber temperature to fall to 5°C. Check the chamber temperature on the temperature indicator.

5. Turn on the fluorescent light switch to check the light. After checking, turn off the switch if the light is not necessary.

6. Set the desired temperature. When the chamber temperature gets to the set temperature, begin slowly placing items into the chamber to minimize the temperature rise.

> **⚠CAUTION**
> The chamber is refrigerated by the forced circulation of cooled air inside the chamber. Ensure that the air intake and exhaust vents are not blocked. Adequate space should be provided between the items inside the unit to allow air circulation.

If any electrical equipment is used in the chamber, the chamber temperature cannot be maintained due to the heat emission from the equipment. Refer to the table below when you use any equipment.

(at ambient temperature of 35°C)

Heat load in chamber	Lowest chamber temperature
100 W	2°C
200 W	9°C
300 W	18°C

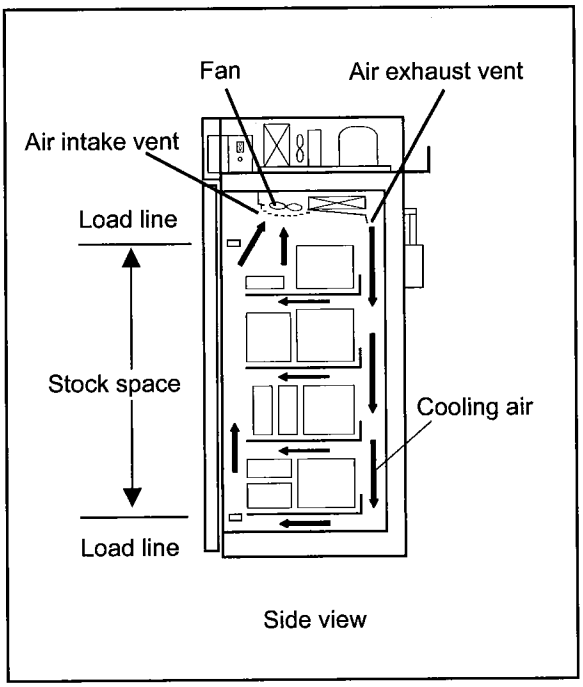
STOCK OF CONTAINERS

Always distribute items so as not to disturb the air circulation in the chamber. Disruption of the air flow can cause items to freeze or reduce the uniformity of the chamber temperature.
Never put any articles on the top of the unit.

Air intake vent
Do not block this vent with containers. If this vent becomes blocked, temperature regulation becomes unstable. Do not place paper or vinyl near the vent as they may be sucked into the fan.

Air exhaust vent
Do not block this vent with containers as this can impede air circulation. Items stored near the exhaust air vent can freeze when the refrigerator is operating at temperature settings lower than 5°C.

Load line
In this refrigerator, storage space is limited to allow the passage of cool air around the chamber. The label "load line" is fixed to both sides of the chamber. Always stock items within this line.



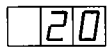
⚠CAUTION
Never store corrosive substances in this unit. This may lead to damage to the inner components or electric parts.

CHAMBER TEMPERATURE SETTING

Table 1 shows the basic procedure for setting the chamber temperature. Perform key operations in the sequence indicated in the table. The example in the table is based on the assumption that the desired temperature is 4°C.

Note: The unit is set at the factory with a chamber temperature of 5°C.

Table 1 Basic operation sequence (Example: Chamber set temperature 4°C)

	Description of operation	Key operated	Indication after operation
1	Turn the power switch ON.	----	The current chamber temperature is displayed.
2	Press set key.	SET	The first digit is flashed.
3	Press numerical value shift key and scroll the figure to 4.	▲	When pressed, the figure of settable digit increases.
4	Press set key.	SET	Set temperature is memorized and the current chamber temperature is displayed. 

Note:

The temperature set mode returns to the temperature display mode automatically when 90 seconds has passed without any key operation. In this case, the chamber temperature setting is not accepted.

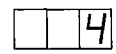
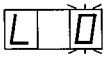
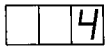
The available set range of chamber temperature is between 2 and 23°C. The partial freezing may occurred if the set temperature is lower than 3°C.

KEY LOCK FUNCTION

This unit is provided with a key lock function. When the key lock is ON, change of temperature setting through the key pad is not available. The key lock is set in OFF at the factory.

Display	Mode	Function
L 0	Key lock is OFF	Enable to change of temperature setting
L 1	Key lock is ON	Disable to change of temperature setting

Table 2 Procedure for key lock setting (change from key lock OFF to key lock ON)

	Description of operation	Key operated	Indication after operation
1		----	The current chamber temperature is displayed. 
2	Press digit shift key for 5 seconds.	▶▶	The first digit is flashed. 
3	Press numerical value shift key and scroll the figure to 1.	▲	When pressed, the figure of settable digit increases.
4	Press set key.	SET	The key lock is set to ON. The current chamber temperature is displayed. 

ALARM TEMPERATURE SETTING

This unit is provided with both high and low temperature alarms. The temperature at which the alarm is activated may be changed.

The available set range for high temperature alarm is between +2°C and +14°C and -2°C and -14°C for low temperature alarm against the chamber temperature.

Note: The temperature alarm is set at ±5°C of the set temperature at the factory.

Display	Mode	Function
F01	High temperature alarm set	See Table 5 on page 19
F02	Low temperature alarm set	See Table 5 on page 19

As an example, Table 3 shows the procedure to set the high temperature alarm so that the alarm can activate when the chamber temperature is 3°C higher than the set temperature.

Table 4 shows the procedure to set the low temperature alarm so that the alarm can activate when the chamber temperature is 3°C lower than the set temperature.

Table 3 Procedure for setting high temperature alarm

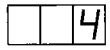
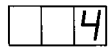
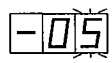
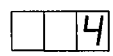
	Description of operation	Key operated	Indication after operation
1		----	The current chamber temperature is displayed.
2	Press numerical value shift key for 5 seconds.	▲	The first digit is flashed.
3	Press numerical value shift key and scroll the figure to 1.	▲	When pressed, the figure of settable digit increases.
4	Press set key.	SET	The first digit is flashed.
5	Set the temperature to 003 with the digit shift key and numerical value shift key.	▶▶	Pressing the key shifts the digit which can be set.
		▲	When pressed, the figure of settable digit increases.
6	Press set key.	SET	Alarm temperature is memorized and the current chamber temperature is displayed. 

Table 4 Procedure for setting low temperature alarm

	Description of operation	Key operated	Indication after operation
1		----	The current chamber temperature is displayed. 
2	Press numerical value shift key for 5 seconds.	▲	The first digit is flashed.
3	Press numerical value shift key and scroll the figure to 2.	▲	When pressed, the figure of settable digit increases.
4	Press set key.	SET	The first digit is flashed. 
5	Set the temperature to -03 with the digit shift key and numerical value shift key.	▶▶	Pressing the key shifts the digit which can be set.
		▲	When pressed, the figure of settable digit increases.
6	Press set key.	SET	Alarm temperature is memorized and the current chamber temperature is displayed. 

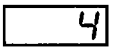
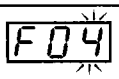
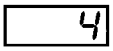
SETTING OF DELAY OF DOOR ALARM

The door check indicator is light when the door is opened, and the alarm buzzer sounds with some delay to notice the door opening.

The delay time (between lighting of the door check indicator and activation of the alarm buzzer) can be changed. Set an appropriate delay time according to the condition of use to prevent the rise of chamber temperature resulting from inadequate door close.

- Setting range of delay time: 1 and 15 minutes
- Initial setting (factory setting): 2 minutes

Table 5 Procedure for setting of delay of door alarm (Change the delay time to 3 min. from 2 min.)

	Description of operation	Key operated	Indication after operation
1		-----	The current chamber temperature is displayed. 
2	Press up arrow key for 5 seconds.	▲▲	F00 is displayed and the first digit blinks.
3	Press up arrow key 4 times.	▲▲	The display is changed to F04 from F00. 
4	Press set key.	SET	The current setting (002) is displayed and the first digit blinks.
5	Press up arrow key and scroll the figure to 3.	▲▲	The display is changed to 003 from 002.
6	Press set key.	SET	Delay time is memorized and the current chamber temperature is displayed. 

Note:

The setting mode returns to the temperature display mode automatically when 90 seconds has passed without any key operation (auto-return function). In this case, the setting is not accepted.

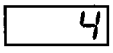
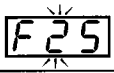
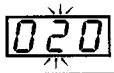
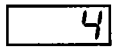
SETTING OF RINGBACK OF ALARM BUZZER

The alarm buzzer operates again after certain period (ringback time) even if the alarm buzzer is silenced by pressing the alarm buzzer stop key (BUZZER) when the same alarm status is continued. Set the ringback time to prevent the misidentify the alarm status.

- Setting range of ringback time: between 10 and 60 minutes (10 minutes interval)
  Display of setting: between 010 and 060 (000 display shows no ringback)
- Initial setting (factory setting): 30 minutes

The alarm buzzer will not recover once the alarm buzzer is silenced by pressing the alarm buzzer stop key (BUZZER) when the ringback time is set to 000. However, the alarm buzzer will operate if other alarm status is detected.

Table 6 Procedure for setting of ringback of alarm buzzer (Change the ringback time to 20 min. from 30 min.)

	Description of operation	Key operated	Indication after operation
1		-----	The current chamber temperature is displayed. 
2	Press up arrow key for 5 seconds.	▲▲	F00 is displayed and the first digit blinks.
3	Press up arrow key 5 times.	▲▲	The display is changed to F05 from F00.
4	Press scroll key once.	▶▶	The second digit blinks.
5	Press up arrow key twice.	▲▲	The display is changed to F25 from F05. 
6	Press set key.	SET	The current setting (030) is displayed and the second digit blinks.
7	Press up arrow key and scroll the figure to 2.	▲▲	The display is changed to 020 from 030. 
8	Press set key.	SET	Ringback time is memorized and the current chamber temperature is displayed. 

Note:

- The setting mode returns to the temperature display mode automatically when 90 seconds has passed without any key operation (auto-return function). In this case, the setting is not accepted.
- The setting should be performed during normal operation, not during alarm status.

OPERATION CHECK AFTER RECOVERY

After recovery from a power failure, the unit will resume operation automatically with the setting before power failure. Accordingly, there is no need for re-set however, always check the running status after recovery.

- The set value is memorized by nonvolatile memory during power failure.

DEFROST CYCLES

There is no need for routine defrosting of the unit as this occurs automatically as follows:

- **Cycle defrost**

To keep the chamber temperature stable, the refrigeration compressor is cycled on and off. During OFF period any frost which has accumulated on the evaporator is melted by energizing a defrost heater. This will not have any discernible effect on the chamber temperature.

- **Forced defrost**

When the ambient humidity is high, or a large amount of damp product is being stored inside the chamber, there is a possibility that cycle defrost may not be enough to remove all of the frost on the evaporator. In this case, a forced defrost cycle can be initiated.
When the unit is operating under a forced defrost cycle, the current chamber temperature and dF is displayed alternately on the digital temperature display.
Once the forced defrost cycle is completed, normal operation resumes.

⚠CAUTION

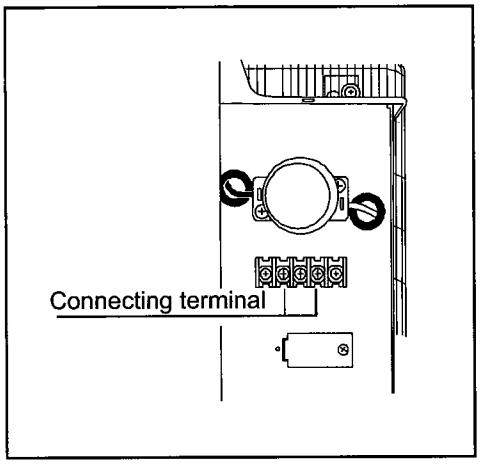
The unit may collect excessive frost on the evaporator if it is installed in high temperature and high humidity location. For example, the unit starts to defrost once a week with 2°C setting in the ambient of 35°C and 80% R.H. **The chamber temperature goes up to approximately 10°C temporarily during defrosting.**

REMOTE ALARM TERMINAL

The remote alarm terminal is located inside the front cover. The alarm is generated from this terminal.
Contact capacity is DC 30 V, 2 A.

	between COM. and N.O.	between COM. and N.C.
At normal	Open	Close
At abnormal	Close	Open

Note:
The alarm is actuated when the power failure or the power cord is disconnected from the outlet.
The remote alarm is silenced by pressing the buzzer stop key (BUZZER) as the remote alarm is operated in conjunction with the buzzer.



ALARMS & SAFETY FUNCTIONS

This unit has the alarms and safety functions shown in Table 7, and also self diagnostic functions.

Table 7 Alarms and safety functions

Alarm & Safety	Situation	Indication	Buzzer	Safety operation
High temperature alarm	If the chamber temperature deviates from the set temperature +2°C or up to +14°C.	Alarm lamp is flashed. Chamber temperature is flashed.	Intermittent tone with 15 minutes delay.	Remote alarm with 15 minutes delay.
Low temperature alarm	If the chamber temperature deviates from the set temperature -2°C or up to -14°C.	Alarm lamp is flashed. Chamber temperature is flashed.	Intermittent tone with 15 minutes delay.	Remote alarm with 15 minutes delay.
	If the chamber temperature is lower than 0°C.		Intermittent tone	Remote alarm
Over-heat protection	When the chamber temp. is higher than 30°C. (Reset when the chamber temp. is lower than 25°C)	-----	-----	Inside fan, drain pan heater, defrost heater, drain pipe heater OFF
Over-cooling protection	When the chamber temp. is lower than -1°C. (Reset when the chamber temp. is higher than 6°C)	-----	-----	Compressor OFF
Power failure alarm	When the power to the unit is disconnected.	-----	-----	Remote alarm.
Power failure alarm (with MPR-48B)	At power failure. If the power supply cord is unplugged.	Alarm lamp blinks.	Intermittent tone	Alarm status.
Door alarm	When the door is open.	Door check lamp is lit.	Intermittent tone with 2 minutes delay.	-----
Auto-return	When there is no key pressing in each setting mode for 90 seconds.	Chamber temperature is displayed.	-----	Finishing of each setting mode.
Key lock	When the key lock is "ON".	-----	-----	Change of setting is disable.
Sensor abnormality	If the thermal sensor is disconnected.	Alarm lamp is flashed. E01 and 50°C (or -50°C) are displayed alternately.	Intermittent tone	Remote alarm. Unit keeps continuous running.
	If the thermal sensor is short-circuited.	Alarm lamp is flashed. E02 and 50°C (or -50°C) are displayed alternately.	Intermittent tone	Remote alarm. Unit keeps continuous running.
	If the defrost sensor is disconnected.	Alarm lamp is flashed. E03 and chamber temp. are displayed alternately.	Intermittent tone	Remote alarm.
	If the defrost sensor is short circuited.	Alarm lamp is flashed. E04 and chamber temp. are displayed alternately.	Intermittent tone	Remote alarm.
	If the compressor sensor is disconnected.	Alarm lamp is flashed. E05 and chamber temp. are displayed alternately.	Intermittent tone	Remote alarm.
	If the compressor sensor is short-circuited.	Alarm lamp is flashed. E06 and chamber temp. are displayed alternately.	Intermittent tone	Remote alarm.
	If the ambient temp. sensor is disconnected.	Alarm lamp is flashed. E07 and chamber temp. are displayed alternately.	Intermittent tone	Remote alarm.
	If the ambient temp. sensor is short-circuited.	Alarm lamp is flashed. E08 and chamber temp. are displayed alternately.	Intermittent tone	Remote alarm.
Memory back-up	When power failure or disconnected the power cord.	-----	-----	Set value memorized
Setting check (with MPR-48B)	When the battery switch is turned ON without setting after attachment.	E09 and chamber temp. is displayed alternately.	-----	-----
Condenser temp. abnormality	In the event of failure of fan motor for cooling the compressor	E10 and chamber temp. are displayed alternately.	Intermittent tone	Remote alarm. Compressor of high stage side stops.

Note:

The remote alarm is silenced by pressing the alarm buzzer stop key (BUZZER) as the remote alarm is operated in conjunction with the buzzer, except for the power failure alarm.

When more than two alarm conditions occur simultaneously, the lowest number error code has priority on the error display.

After a power failure, the unit will resume operation with the set value that was in place before power failure occurred.

The over-cooling protection may activate when the set temperature is 2°C. In this case, the chamber temperature will rise to 6°C, but this is not malfunction.

ROUTINE MAINTENANCE

⚠WARNING

Always disconnect the power supply to the unit prior to any repair or maintenance of the unit in order to prevent electric shock or injury.

Ensure you do not inhale or consume medication or aerosols from around the unit at the time of maintenance. These may be harmful to your health.

⚠CAUTION

Always wear dry gloves to protect hands at the time of maintenance. Failure to wear gloves may result in injury from edges and corners.

Cleaning of cabinet

- Clean the unit once a month. Regular cleaning keeps the unit looking new.
- Use a dry cloth to wipe off small amounts of dirt on the outside and inside of the unit and all accessories. If the outside panels are dirty, clean them with a diluted neutral dishwashing detergent. (Undiluted detergent can damage the plastic components. For the dilution, refer to the instruction of the detergent.) After the cleaning with the diluted detergent, always wipe it off with a wet cloth. Then wipe off the cabinet or accessories with a dry cloth.
- Never pour water onto or into the unit. Doing so can damage the electric insulation and cause failure.
- The compressor and other mechanical parts are completely sealed. This unit requires absolutely no lubrication.

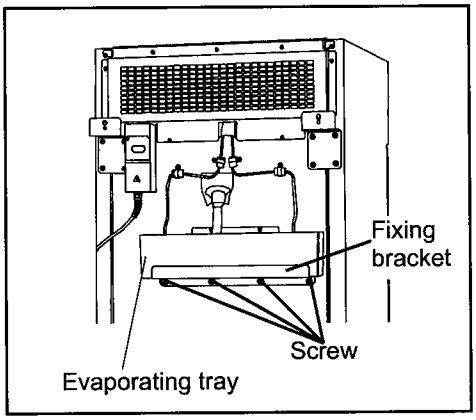
Cleaning of evaporating tray

This unit is provided with the evaporating tray on the back.

1. Four screws of the fixing bracket are removed.

2. The evaporating tray downwards to removed.

3 Wash the evaporating tray and replace.



ROUTINE MAINTENANCE

Replacement of fluorescent lamp

Follow the procedure below when replacing a fluorescent lamp. The fluorescent lamp is located horizontally at upper front of the cabinet.

1. Turn off the light switch and disconnect the power supply plug of the refrigerator.

2. Move the stored items on the top shelf and in the top drawer.

3. Pull the fluorescent lamp downwards from the stopper together with the lamp cover and wiring. [Fig. 1]

4. Remove the water-proof cover with the wiring on the both sides of the lamp cover.

5. Take out the fluorescent lamp and insert a new fluorescent lamp into the lamp cover. [Fig. 2]
(fluorescent lamp; FL20SD)

6. Replace the water-proof cover on the both sides of the lamp cover and then replace the lamp cover to the stopper.

7. Replace the stored items on the top shelf and in the top drawer and connect the power supply cord to the outlet.

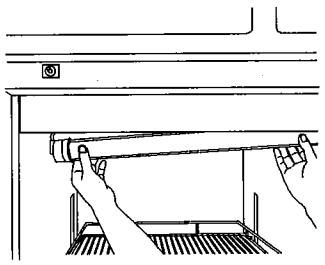


Fig.

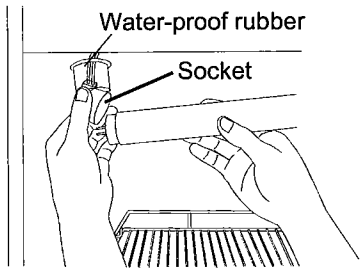


Fig.

Replacement of glow starter

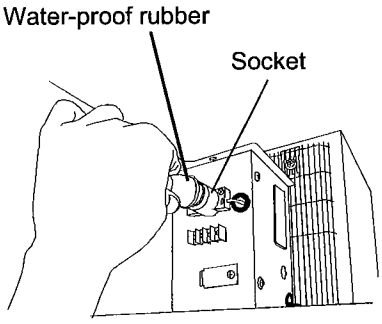
A glow starter is located inside the front cover.

1. Disconnect the power supply plug.

2. Remove the water-proof rubber.

3. Remove the glow starter and replace with a new one.

4. Replace the water-proof rubber.



TROUBLE SHOOTING

If the unit malfunctions, check out the following before calling for service.

Malfunction	Check/Remedy
If nothing operates even when switched on	▪ There is a power failure. ▪ The circuit breaker is activated. ▪ The unit is not connected to the power supply.
When no key operation is available	▪ The key lock is set in ON (L 1).
The alarm device is activated	**< On start-up >** ▪ The temperature in the unit does not match the set value. **< In use >** ▪ The door was kept opened for a long time. ▪ The temperature setting was changed. ▪ The containers of high temperature (load) were put in the unit. In these cases, alarm is removed automatically by running the unit for several hours.
When unit does not get cold enough	▪ A large amount of items or warm product was put in the unit. ▪ The air exhaust vent is blocked up with containers. ▪ The unit is in direct sunlight. ▪ The door is frequently opened. ▪ There is a nearby heat source. ▪ The ambient temperature is too high. ▪ The door is not securely closed. ▪ The heat source is put in the unit. ▪ The door seal is damaged or foreign substance is inserted between door gaskets.

Note:

If the malfunction is not eliminated after checking the above items, or the malfunction is not shown in the above table, contact Sanyo sales representative or agent.

DISPOSAL OF UNIT

⚠WARNING

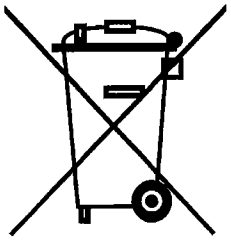
If the unit is to be stored unused in an unsupervised area for an extended period **ensure that children do not have access and doors cannot be closed completely.**

The disposal of the unit should be accomplished by appropriate personnel. Always remove doors to prevent accidents such as suffocation.

DISPOSAL OF UNIT

Note:
This symbol mark and recycle system are applied only to EU countries and not applied to the countries in the other area of the world.

Waste Electrical and Electronic Equipment (WEEE) Directive-2002/96/EC



(English)
Your SANYO product is designed and manufactured with high quality materials and components which can be recycled and reused.

This symbol means that electrical and electronic equipment, at their end-of-life, should be disposed of separately from your household waste.

Please dispose of this equipment at your local community waste collection/recycling centre.

In the European Union there are separate collection systems for used electrical and electronic products.

Please help us to conserve the environment we live in!

(German)
Ihr SANYO Produkt wurde entworfen und hergestellt mit qualitativ hochwertigen Materialien und Komponenten, die recycelt und wiederverwendet werden können.

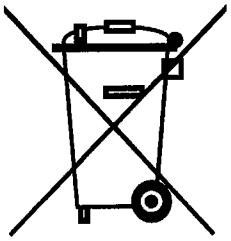
Dieses Symbol bedeutet, daß elektrische und elektronische Geräte am Ende ihrer Nutzungsdauer von Hausmüll getrennt entsorgt werden sollen.

Bitte entsorgen Sie dieses Gerät bei Ihrer örtlichen kommunalen Sammelstelle oder im Recycling Centre.

In der Europäischen Union gibt es unterschiedliche Sammelsysteme für Elektrik- und Elektronikgeräte.

Helfen Sie uns bitte, die Umwelt zu erhalten, in der wir leben!

DISPOSAL OF UNIT



(French)
Votre produit Sanyo est conçu et fabriqué avec des matèriels et des composants de qualité supérieure qui peuvent être recyclés et réutilisés.

Ce symbole signifie que les équipements électriques et électroniques en fin de vie doivent être éliminés séparément des ordures ménagères.

Nous vous prions donc de confier cet équipement à votre centre local de collecte/recyclage.
Dans l'Union Européenne, il existe des systèmes sélectifs de collecte pour les produits électriques et électroniques usagés.

Aidez-nous à conserver l'environnement dans lequel nous vivons !

Les machines ou appareils électriques et électroniques contiennent fréquemment des matières qui, si elles sont traitées ou éliminées de manière inappropriée, peuvent s'avérer potentiellement dangereuses pour la santé humaine et pour l'environnement.
Cependant, ces matières sont nécessaires au bon fonctionnement de votre appareil ou de votre machine. Pour cette raison, il vous est demandé de ne pas vous débarrasser de votre appareil ou machine usagé avec vos ordures ménagères.

(Spanish)
Los productos SANYO están diseñados y fabricados con materiales y componentes de alta calidad, que pueden ser reciclados y reutilizados.

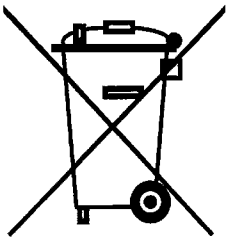
Este símbolo significa que el equipo eléctrico y electrónico, al final de su ciclo de vida, no se debe desechar con el resto de residuos domésticos.

Por favor, deposite su viejo "televisor" en el punto de recogida de residuos o contacte con su administración local.

En la Unión Europea existen sistemas de recogida específicos para residuos de aparatos eléctricos y electrónicos.

Por favor, ayúdenos a conservar el medio ambiente!

DISPOSAL OF UNIT



(Portuguese)
O seu produto SANYO foi concebido e produzido com materiais e componentes de alta qualidade que podem ser reciclados e reutilizados.

Este símbolo significa que o equipamento eléctrico e electrónico no final da sua vida útil deverá ser descartado separadamente do seu lixo doméstico.

Por favor, entregue este equipamento no seu ponto local de recolha/reciclagem.

Na União Europeia existem sistemas de recolha separados para produtos eléctricos e electrónicos usados.

Por favor, ajude-nos a conservar o ambiente em que vivemos!

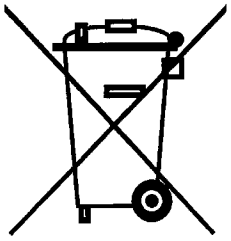
(Italian)
Il vostro prodotto SANYO è stato costruito da materiali e componenti di alta qualità, che sono riutilizzabili o riciclabili.

Prodotti elettrici ed elettronici portando questo simbolo alla fine dell'uso devono essere smaltiti separatamente dai rifiuti casalinghi.

Vi preghiamo di smaltire questo apparecchio al deposito comunale.
Nell'Unione Europea esistono sistemi di raccolta differenziata per prodotti elettrici ed elettronici.

Aiutateci a conservare l'ambiente in cui viviamo!

DISPOSAL OF UNIT



(Dutch)
Sanyo producten zijn ontwikkeld en gefabriceerd uit eerste kwaliteit materialen, de onderdelen kunnen worden gerecycled en weer worden gebruikt.

Het symbool betekent dat de elektrische en elektronische onderdelen wanneer deze vernietigd gaan worden , dit separaat gebeurt van het normale huisafval.

Zorg ervoor dat het verwijderen van de apparatuur bij de lokaal erkende instanties gaat gebeuren.
In de Europese Unie wordt de gebruikte elektrische en elektronische apparatuur bij de daarvoor wettelijke instanties aangeboden.

Alstublieft help allen mee om het milieu te beschermen.

(Swedish)
Din SANYO produkt är designad och tillverkad av material och komponenter med hög kvalitet som kan återvinnas och återanvändas.

Denna symbol betyder att elektriska och elektroniska produkter, efter slutanvändande, skall sorteras och lämnas separat från Ditt hushållsavfall.

Vänligen, lämna denna produkt hos Din lokala mottagningstation för avfall/återvinningsstation.

Inom den Europeiska Unionen finns det separata återvinningssystem för begagnade elektriska och elektroniska produkter.

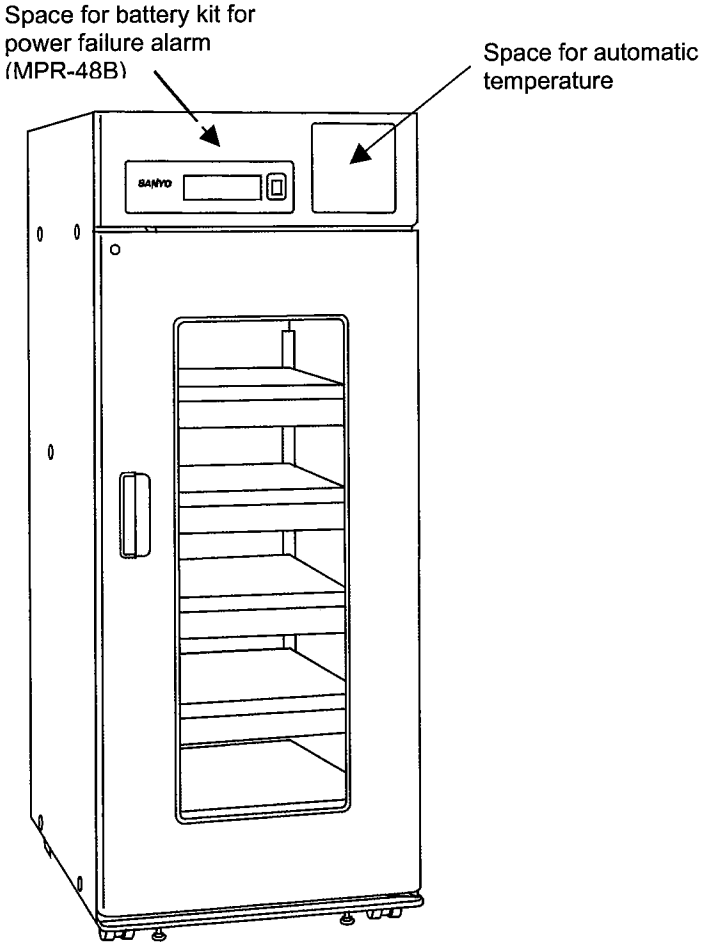
Vänligen, hjälp oss att bevara miljön vi lever i!

OPTIONAL COMPONENTS

Automatic temperature recorder

An automatic temperature recorder is available for this refrigerator as an optional accessory. If an automatic temperature recorder is required, contact your Sanyo dealer.
Recorders available are the MTR-0621LH and the MTR-G04A or MTR-G04C. Please note that each recorder needs a different fixture. See the following for the details.

Temperature recorder	Type	Recording range	Recorder fixture
MTR-0621LH	30 days (split chart type)	-6 to + 20°C	MPR-S30
MTR-G04A (AC 100 to 150 V)	7 days (circular chart type)	-10 to + 40°C	MPR-S7
MTR-G04C (AC 200 to 240 V)	7 days (circular chart type)	-10 to + 40°C	MPR-S7



OPTIONAL COMPONENTS

Attachment of recorder MTR-0621LH

1. Follow the instruction manual provided with the temperature recorder and attach the recorder to the fixture MPR-S30.

2. Open the aperture for the recorder on the front top of the unit by removing the locating screw and remove the cover by pushing the shaft on both sides outwards. (Fig. 1)

3. Attach the recorder to the front cover with the screw.

4. Remove the black rubber caps (inside and outside) on the access port located at the top corner of the unit and take the insulation out of the access port.

5. Pass the recorder sensor into the chamber through the access port. (Fig. 2)

6. Fix the recorder sensor to the fan cover located at the top of the chamber with the binder provided. (Fig. 3)

7. Route the capillary on the top of the chamber and fix it at two points with the provided clips and screws. (Fig. 4)

8. Replace the insulation in the access port.

9. Make a cut on the rubber caps so that the capillary can pass the caps and place them back on the access port (inside and outside). (Fig. 5)

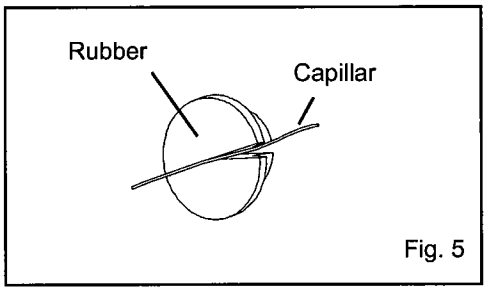


Fig. 5

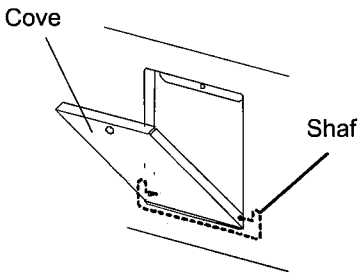


Fig. 1

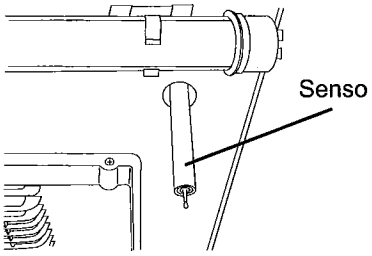


Fig. 2

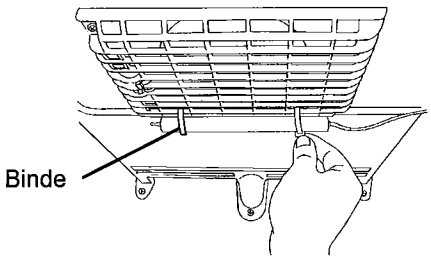


Fig. 3

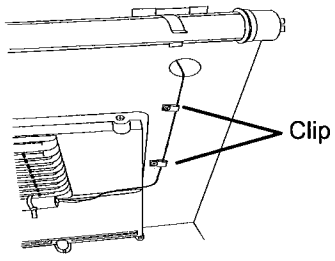


Fig. 4

OPTIONAL COMPONENTS

Attachment of recorder MTR-G04A or MTR-G04C

1. Follow the instruction manual provided with the temperature recorder and attach the recorder to the fixture MPR-S7.

2. Open the aperture for the recorder on the front top of the unit by removing the locating screw and remove the cover by pushing the shaft on both sides outwards. (Fig. 6)

3. Remove the black rubber caps (inside and outside) on the access port located at the top corner of the unit and take the insulation out of the access port.

4. Pass the recorder sensor into the chamber through the access port. (Fig. 7)

5. Fix the recorder sensor to the fan cover located at the top of the chamber with the binder provided. (Fig. 8)

6. Route the capillary on the top of the chamber and fix it at two points with the provided clips and screws. (Fig. 9)

7. Replace the insulation in the access port.

8. Make a cut on the rubber caps so that the capillary can pass the caps and place them back on the access port (inside and outside). (Fig. 10)

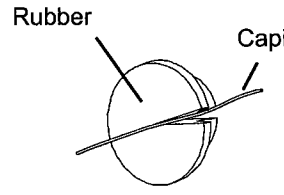


Fig. 10

9. Bind the lead wire on the right upper side of the unit with the provided band.

10. Remove the connector cap located on the left side and then connect the recorder connector.

11. Attach the recorder on the front cover with a screw.

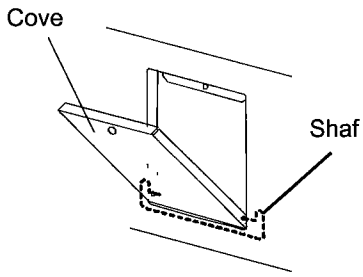


Fig. 6

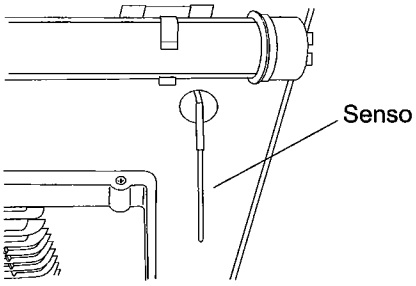


Fig. 7

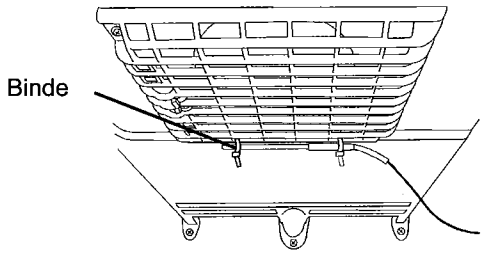


Fig. 8

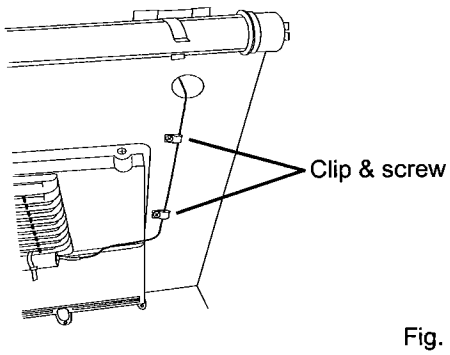


Fig. 9

OPTIONAL COMPONENTS

Attachment of battery kit MPR-48B

The alarm lamp blinks and the alarm buzzer sounds to notice the power failure when a battery for power failure alarm is installed. For the installation of the battery for power failure alarm, a battery kit (MPR-48B), an optional component is necessary. A battery for power failure alarm is included in the battery kit.

- Contact Sanyo sales representative or agent for the installation of the battery kit (MPR-48B).

1. Remove the top cover on the top of the products by unscrewing four screws. (The battery kit for power failure alarm is installed on top of the products.)

2. Release the harnesses from the clip fixed to the back of the top cover. [Fig. 1]

3. Pass the harnesses through the bottom opening of the battery box and set the battery box on the control panel of the refrigerator top so that four screw holes can be aligned. [Fig. 1]

- The battery box should be located with the battery switch faced to the refrigerator front.

4. Put the battery on the left of the battery box. [Fig. 2]

5. Put the battery fixture over the battery and fix the battery box and battery fixture by four screws. [Fig. 3]

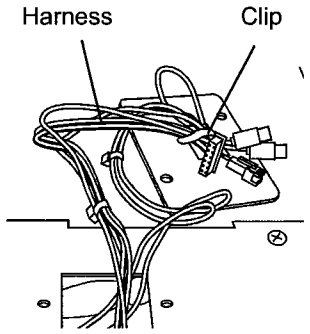


Fig. 1

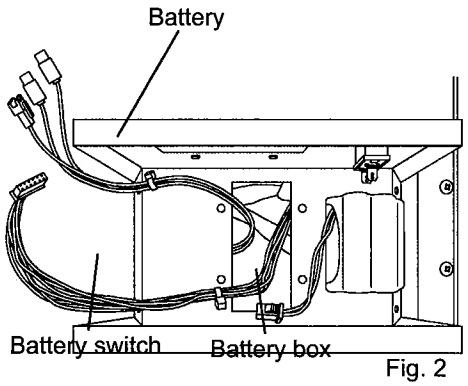


Fig. 2

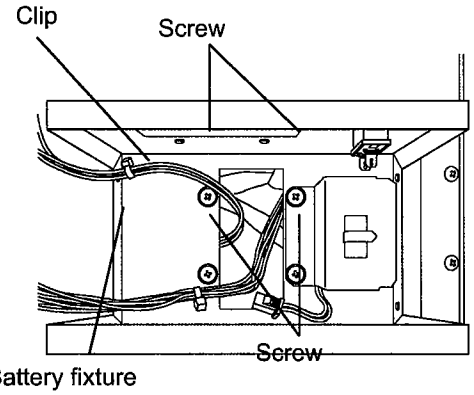


Fig. 3

OPTIONAL COMPONENTS

6. Connect the harness to the battery connector and battery switch [Fig. 3] and bind the harnesses by the clip on the battery fixture. [Fig. 2]

7. Cover the opening beside the battery switch with the top cover removed in procedure 1 (four screws). The harness in no use is bound by the clip on the back of the top cover.

8. Put the battery box cover over the battery box and fix the battery box cover with screws (three screws on the right and left). [Fig. 5]

9. Perform the setting for battery through the keys on the control panel of refrigerator. Refer to the procedure on the next page "Setting for battery before starting"

10. Switch on the battery switch on the battery box.

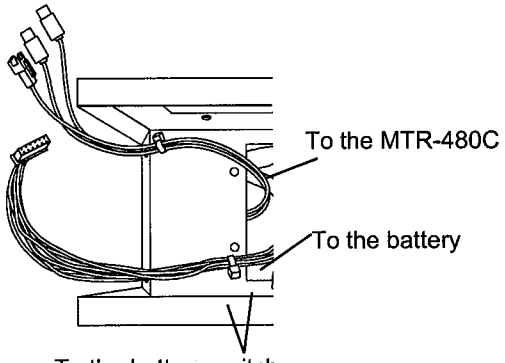
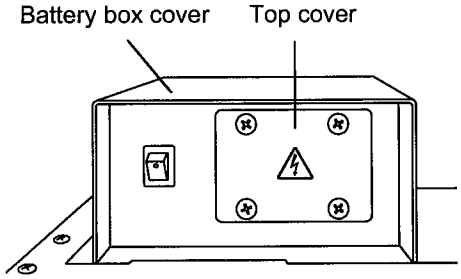


Fig. 4



<front view>
Fig. 5

Attachment of interface board MTR-480C

Install MTR-480C by the next process.

1. Remove the battery box cover on the battery box (Fig.5).
2. The connector for MTR-480C (Fig.4) is connected to the connector of RS485 (Fig.6).

3. Cover the opening beside the battery switch with the top MTR-480C (four screws).

4. Replace the top cover.

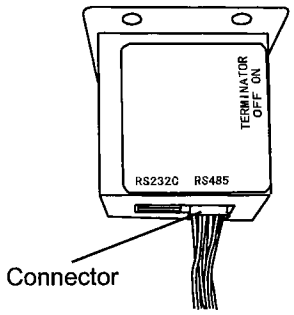


Fig. 6

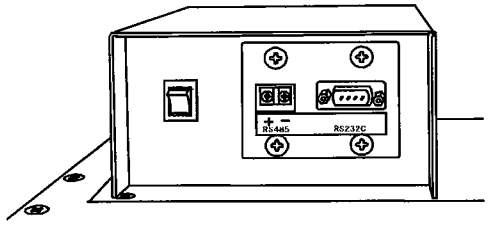


Fig. 7

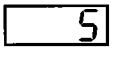
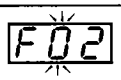
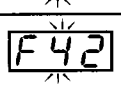
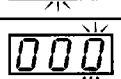
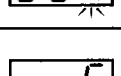
OPTIONAL COMPONENTS

Setting for battery before starting

Always perform the setting shown below after the installation of battery for power failure alarm, an optional component (MPR-48B).

The chamber temperature and "E09" is displayed on the temperature display alternately if the battery switch is turned on without following procedure.

- Turn off the battery switch, perform the following setting, and turn on the battery switch again if "E09" is displayed on the temperature display.

	Description of operation	Key operated	Indication after operation
1		-----	The current chamber temperature is displayed. 
2	Press numerical value shift key for 5 seconds.	▲▲	F00 is displayed and the first digit blinks.
3	Press numerical value shift key twice.	▲▲	The display is changed to F02 from F00.
4	Press digit shift key once.	▶▶	The second digit blinks. 
5	Press numerical value shift key 4 times.	▲▲	The display is changed to F42 from F02. 
6	Press set key.	SET	The current setting (000) is displayed and the first digit blinks. 
7	Press numerical value shift key and scroll the figure to 1.	▲▲	The display is changed to 001 from 000.
8	Press set key.	SET	The setting is memorized and the current chamber temperature is displayed. 

SPECIFICATIONS

Name	Pharmaceutical Refrigerator	
Model	MPR-721	MPR-721R
External dimensions	W770 x D830 x H1955 (mm)	
Internal dimensions	W650 x D710 x H1500 (mm)	
Effective capacity	684 L	671 L
Exterior	Painted steel	
Interior	Painted steel	
Door	Double layer pair glass/steel plate, automatic closing mechanism	
Insulation	Rigid polyurethane foamed-in place	
Shelf	Hard steel wire on polyethylene coating 4 pcs. (Max. load; 50 kg/shelf)	-----
Drawer	-----	Painted steel 5 pcs. (Max. load; 40 kg/drawer)
Access port	Top side, Left side, Right side, Inner diameter 30 mm	
Compressor	Hermetic type, Output; 200 W	
Condenser	Wire and tube type	
Evaporator	Fin and tube type	
Refrigerant	R-134a	
Internal heater	153 W	
Temperature controller	Microprocessor control system	
Temperature display	Digital display	
Alarm	High temperature, Low temperature, Door, Power failure, Sensor	
Remote alarm contact	Allowable contact capacity: DC 30 V, 2 A	
Memory back-up	Nonvolatile static memory	
Fluorescent lamp	White light 20 W (FL20SD) x 1 (Glow starter; FG-1P)	
Accessories	1 set of key, 2 sets of bolt, 2 nylon clips, 2 binders	
Weight	174 kg	193 kg
Optional component	Automatic temperature recorder (MTR-0621LH). Recorder fixture (MPR-S30) Automatic temperature recorder (MTR-G04A/MTR-G04C). Recorder fixture (MPR-S7) Battery kit for power failure alarm (MPR-48B). Interface board (MTR-480C)	

Note: Design or specifications will be subject to change without notice.

PERFORMANCE

Cooling performance	2 to 14°C (ambient temperature; -5 to 0°C, no load) 2 to 23°C (ambient temperature; 0 to 35°C, no load)					
Temperature control range	2 to 23°C					
Power source	110V 60Hz	115V 60Hz	220V 60Hz	220V 50Hz	230V 50Hz	240V 50Hz
Rated power consumption	330W	340W	330W	280W	305W	305W
Noise level	41 dB [A] (background noise; 20 dB)					
Maximum pressure	1516 kPa					

Note : The unit with CE mark complies with EC directives 89/336/EEC, 93/68/EEC and 73/23/EEC.

⚠ CAUTION

Please fill in this form before servicing.
Hand over this form to the service engineer to keep for his and your safety.

Safety check sheet

1. Refrigerator contents : ☐Yes ☐No
   Risk of infection: ☐Yes ☐No
   Risk of toxicity: ☐Yes ☐No
   Risk from radioactive sources: ☐Yes ☐No

   (List all potentially hazardous materials that have been stored in this unit.)
   Notes :

2. Contamination of the unit
   Unit interior ☐Yes ☐No
   No contamination ☐Yes ☐No
   Decontaminated ☐Yes ☐No
   Contaminated ☐Yes ☐No
   Others:

3. Instructions for safe repair/maintenance of the unit
   a) The unit is safe to work on ☐Yes ☐No
   b) There is some danger (see below) ☐Yes ☐No
   Procedure to be adhered to in order to reduce safety risk indicated in b) below.

Date :
Signature :
Address, Division :
Telephone :

Product name :	Model :	Serial number :	Date of Installation :
Pharmaceutical Refrigerator	MPR-721 MPR-721R		

Please decontaminate the unit yourself before calling the service engineer.

SANYO Electric Co., Ltd
Printed in Japan